BOGATYREV, YU M

Otpusk pvoerkhnostonzakalennoy konstruckstionnov stali.
(The tempering of case hardened structural steel)
Moskva, Mashgiz, 1950.

110 P. Illus., Tables, Diagrs.
(Russia. Ministerstvo Tyazhelogo Mashinostroyeniya. Kniga 34)
"Literatura": P. 108-109

45626

9.3230

S/141/62/005/006/010/023
E192/E382

AUTHOR: Bogatyrev, Yu.K.

TITLE: Electromagnetic shock waves in a nonlinear line with lumped parameters

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, v. 5, no. 6, 1962, 1130 - 1143

TEXT: The line consists of an infinite number of identical quadripoles with nonlinear coils wound on toroidal ferrite cores (see Fig. 1). This infinite network is described by a system of nonlinear differential-difference equations:

$$\left(1 + RC_o\frac{d}{dt}\right)(i_{n-1} - i_n) = C_o\frac{du_{n-1}}{dt}\ ;$$

$$u_{n-1} - u_n = \frac{d\Phi_n}{dt}\ ; \quad \Phi_n = L_o\left(i_n + \frac{4\pi\eta}{p}M_n\right) \qquad (1)$$

where u_n and i_n are the voltage and current at the output of

Card 1/5

the n-th element, C_o L_o and R_o - linear parameters of the line, η is the "filling" coefficient of the coil, Φ_n is the flux of the n-th coil and M_n is the projection of the magnetization vector $\underline{M}$ on the direction of the magnetic field, $\underline{H}_n = pi_n \underline{z}_o$. It is not possible to find a general solution of Eqs. (1) and only the steady-state solutions of the type:

$$i_{n\pm1}(t) = i_n(t\mp\Delta); \quad u_{n\pm1}(t) = u_n(t\mp\Delta) \qquad (2)$$

are considered, which are in the form of voltage and current waves propagating in the direction of increasing n for $\Delta > 0$ (where Δ is equal to the delay time and one element of the line). Substitution of Eqs. (2) into Eqs. (1) results in the following:

$$\left(1 + \tau_e \frac{d}{d\tau}\right)\left[i(\tau+\bar{\Delta}) - 2i(\tau) + i(\tau-\bar{\Delta})\right] = \frac{d^2 i(\tau)}{d\tau^2} + \frac{4\pi M\eta}{p}\frac{d^2 m(\tau)}{d\tau^2} \qquad (3a)$$

Card 2/5

Electromagnetic shock ....

where $\tau = t/\tau_o$ ($\tau_o^2 = L_o C_o$) which is the normalized time, $\tau_c = RC_o/\tau_o$, $\bar{\Delta} = \Delta/\omega_o$ and $m(\tau) = m_n = M_n/M$ where M is the modulus of the magnetization vector. Eq. (3) is used to investigate the steady-state wave for the case of nonquasi-static magnetization of the ferrite when the relationship between m_n and i_n is described by:

$$\frac{dm_n}{dt} = \alpha\gamma(1 - m_n^2)pi_n/(1 + \alpha^2) \qquad (6)$$

where γ is the magnetomechanical relationship for the electron-spin and α is a dissipation coefficient. Eq. (3a) is solved approximately and an expression for the rise time τ_H of the wave front is derived for the case

$$\tau_R = \tau_c\left[12/(\Delta^2 - \tau_o^2)\right]^{1/2} .$$

This shows that τ_H is dependent on the parameters of the ferrite α_M and its initial state m_o as well as on the other

Card 3/5

parameters of the line elements ($\tau_o^2 = L_o C_o$) . Expressions for the frequency of the oscillations following the front of the shock wave and their decay time are also derived. The above analysis is valid for weak shock waves and an attempt is therefore made to investigate the structure of strong waves. A suitable scattering equation is derived. High-amplitude shock waves are also investigated and it is shown that in this case the wave front can be described by the linear equation:

$$\frac{d^2 i}{d\tau^2} + \tau_R \frac{di}{d\tau} + i = (1 - m_o)\, 1(\tau) \qquad (19)$$

which meets the following boundary conditions $i = 0$ at $\tau = 0$ and $i = i^* = (\Delta^2 - \tau_o^2)pI/4\Upsilon M\eta\tau_o^2)$ at $\tau \to +\infty$. The equation is generally valid except over a small initial portion of the front. It is found that in the case of a very strong shock wave the amplitude of the oscillations is equal to the amplitude of the wave. This is due to the comparatively low energy required for remagnetization of the ferrite. There are 7 figures.

Card 4/5

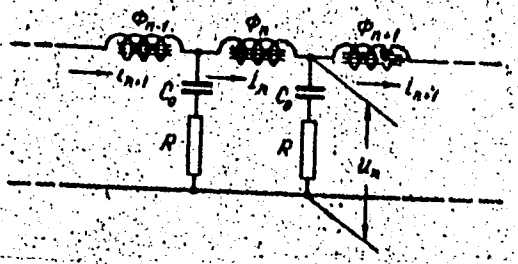
Electromagnetic shock ....

S/141/62/005/006/010/023
E192/E382

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radiophysics Institute of Gor'kiy University)

SUBMITTED: April 10, 1962

Fig. 1:



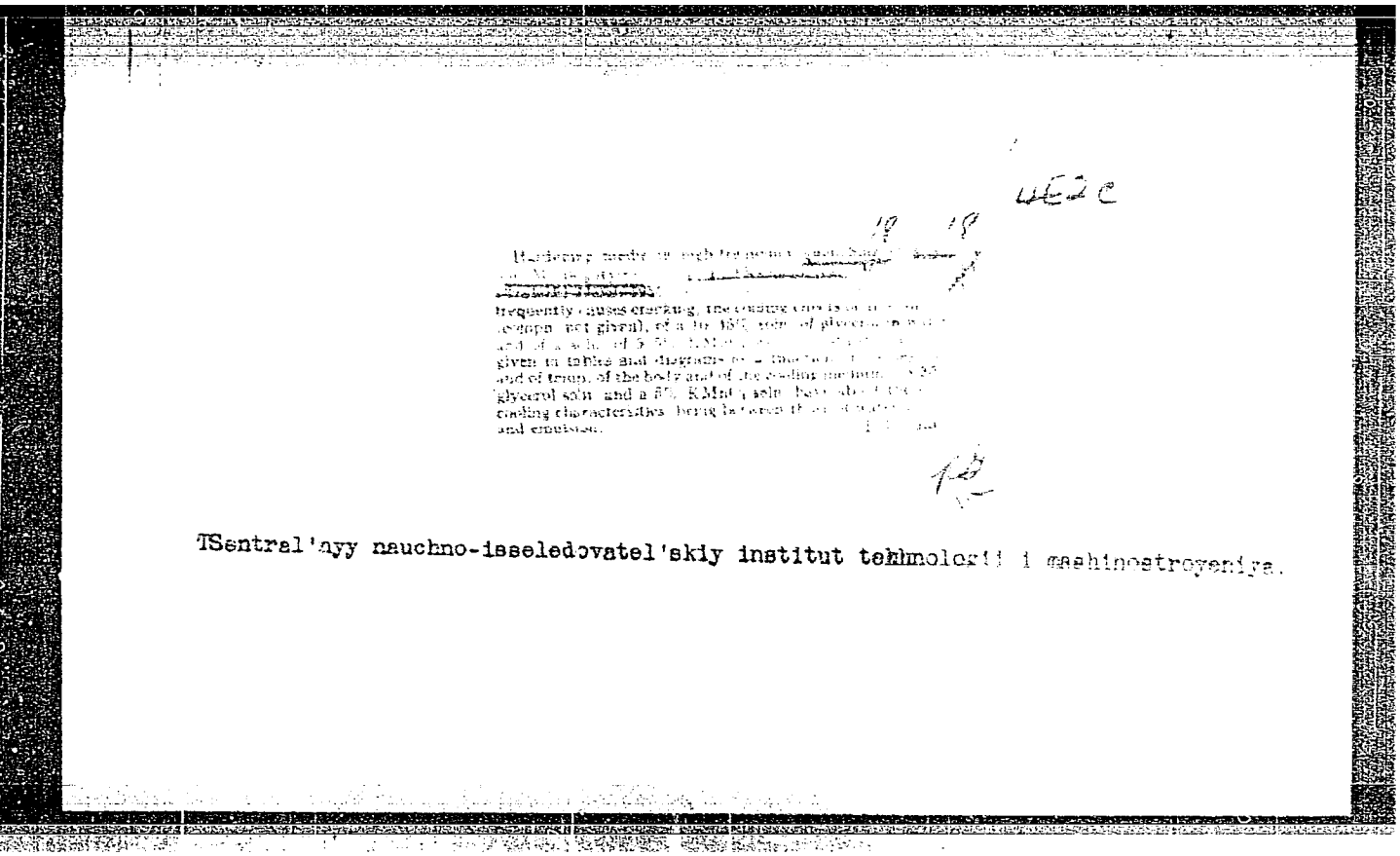
Card 5/5

BOGATYREV, Yu.M.

Electrical tempering of surface hardened steel. [Izdaniia] LONITOMASH no.30:356-365 '52. (MLRA 8:1)
(Steel--Heat treatment)

SHEPELYAKOVSKIY, K.Z., kandidat tekhnicheskikh nauk; BOGATYREV, Yu.M., kandidat tekhnicheskikh nauk, retsenzent; KUNYAVSKIY, M.N., kandidat tekhnicheskikh nauk, redaktor; [illegible]OVA, S.M., tekhnicheskiy redaktor

[Self-hardening of steel in high frequency tempering] Samootpusk stali pri vysokochastotnoi zakalke. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1955. 106 p. (MLRA 8:7)
(Steel--Heat treatment)



TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.

AUTHORS: Bogatyrev, Yu. M. and Gamazkov, S.M., Candidates of Technical Sciences. 129-9-12/14

TITLE: Electric tempering of surface hardened components during subsequent heating. (Elektrootpusk poverkhnostno zakalennykh detaley pri posledovatel'nom nagreve).

PERIODICAL: "Metallovedeniye i Obrabotka Metallov" (Metallurgy and Metal Treatment), 1957, No.9, pp.51-58 (U.S.S.R.)

ABSTRACT: The aim of the work described in this paper was to solve the problem of the possibility of electric tempering of surface hardened components during subsequent induction heating. First, the temperature distribution along the length and cross section of specimens during electric heating is investigated; the authors studied the possibility of maintaining a constant heating regime during the uniform translatory motion of the inductor along the heated component, particularly at low displacement speeds, using currents of 2500 and 50 c.p.s. It was found that a considerable reduction of the speed of movement of the inductor (to 0.5 mm/sec) led in certain cases to non-uniform heating. Uniform heating could only be achieved by either varying the power or the speed of movement of the inductor. Various speeds of inductor movement and various frequencies were tried and the results are

Card 1/4

Electric tempering of surface hardened components during subsequent heating. (Cont.) 129-9-12/14

given. These show that induction heating can be effected by various regimes which ensure the necessary temperature distribution along the cross section of the heated components and also by various speeds of heating and cooling. In further experiments the hardness was measured of specimens after surface hardening, after surface hardening and tempering and after surface hardening and electric tempering; the specimens consisted of "Steel 45" of 500 mm long and 100 mm dia. Further experiments aimed at investigating the structure and the residual stresses. It is concluded that the possibility of utilisation of successive induction heating for the purpose of tempering of surface hardened components is determined by the possibility of uniform heating of various sections along the length of the treated component; fulfilment of this condition (of uniform heating) requires use of such speeds of displacement of the heating equipment relative to the component that the propagation of the heat flux does not cause instability of the process of preliminary heating. The temperature and the speed of heating under conditions of successive electric tempering depend on the transmitted power, the frequency of the

Card 2/4

Electric tempering of surface hardened components during subsequent heating. (Cont.) 129-9-12/14

heating current, the dimensions of the component and the inductor and also on the speed of displacement of the inductor. With increasing frequency of the current, speed of movement of the inductor, dimensions of the component, the surface heating effect will increase. For an equal heating temperature the hardness after electric tempering will decrease to a lesser extent than in the case of ordinary tempering; the higher the temperature the higher will be the difference in the hardness between ordinary and electric tempering. The structure of the hardened steel after electric tempering changes less than for tempering in a furnace, owing to the fact that the component is not held for long durations at the maximum heating temperature. In the case of low temperature electric tempering the residual compression stresses in the hardened layer and tensile stresses in the transient layer decrease more intensively than in the case of equivalent tempering in the furnace. In the case of high temperature electric tempering (400 to 500 C) the residual stresses are redistributed and there is a change in sign: there will be tensile stresses in the surface layer and compressive stresses in the

Card 3/4

Electric tempering of surface hardened components during subsequent heating. (Cont.) 129-9-12/14

transient layer. Electric tempering can be applied more efficiently under shop conditions than furnace tempering. This is due primarily to the larger variety of parameters, by means of which it is possible to change the regimes of the process and thereby to influence the magnitude and character of distribution of the residual stresses in surface hardened components. In introducing electric tempering considerable difficulties may occur owing to absence of reliable methods of measuring the temperature during the rapid processes of induction heating. Therefore, the authors recommend measurement of the temperature by means of a thermocouple welded onto a reference component when working out the technology of electric tempering for a given manufacturing process. The temperature under shop conditions can be effected by means of contact thermocouples or thermo-varnishes. Particular attention must be paid to the stability in operation of the induction equipment if reproduceable results are to be obtained.
There are 9 graphs, 7 references, all of which are Slavic.

ASSOCIATION: TsNIITMASh.
AVAILABLE:
Card 4/4

25(1) PHASE I BOOK EXPLOITATION SOV/1891

Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya

Elektrotermicheskaya obrabotka i elektroiskrovoye uprochneniye detaley; [sbornik] (Electric Heat Treatment and Electrospark Hardening of Parts; Collection of Articles) Moscow, Mashgiz, 1958. 214 p. (Series: Its: [Trudy] kn. 89) Errata slip inserted. 5,600 copies printed.

Ed.: I.Yu. Miloslavskiy, Engineer (Deceased); Ed. of Publishing House: I. Yu. Geller; Tech. Ed.: A. F. Uvarova; Managing Ed. for Literature on General Technical and Transport Machine Building (Mashgiz): K.A. Ponomareva, Engineer.

PURPOSE: This collection of articles is intended for engineering staffs of plants and scientific research institutes dealing with electric heating, electric heat-treatment, and electrospark hardening of metals.

COVERAGE: This collection of articles presents the results of scientific research work carried out by the Department of TsNIITMash (Central Scientific Research Institute of Technology and Machinery) on electric heating in the field of high

Card 1/8

and industrial-frequency heating and electrospark hardening of machine parts. The process of surface hardening, through hardening and tempering of steel and cast iron using induction-heating and electrospark methods, and the results of investigation of the effects of electric-heat treatment and electrospark hardening on the properties of steel and cast iron are described. A brief review of industrial applications of induction heating outside the Soviet Union are also presented. Various electric-heating and electrospark hardening equipment developed by TsNIITMash are described. The book was written for the 20th anniversary of the scientific research work of TsNIITMash, Department of Electric Heating.

TABLE OF CONTENTS:

metals, and development of new equipment and modernizing old types of equipment and apparatus.

water by oil, and by other milder cooling agents, and the effect of the duration and the temperature of annealing are also discussed.

Electric Heat Treatment (Cont.) SOV/1891

The author describes construction of two apparatus, the IAS-2M and IAS-3M developed by TsNIITMash for electrospark hardening of steel surfaces. Technical specifications for both are given, and directions for operating the machines and results that can be obtained with them are included.

AVAILABLE: Library of Congress

GO/fal
8-3-59

Card 8/8

SOV/129-58-12-7/12

AUTHORS: Bogatyrev, Yu.M., Candidate of Technical Sciences and Yeremina, V.P., Engineer

TITLE: Deformation of Surface-hardened Steel (Deformatsiya poverkhnostno zakalennoy stali)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 12, pp 35 - 41 (USSR)

ABSTRACT: The authors investigated the deformation of surface-hardened specimens made of the steels 40, 40Kh and 40KhN as functions of the hardening temperature, the cooling speed, the initial structural state and the low-temperature tempering regime. The investigated specimens were in the shape of hollow cylinders of 55, 105, 50 mm external diameter, 18 mm internal diameter and 15, 15 and 100 mm height, respectively. The dimensions were measured with an accuracy of ± 1μ. The results are graphed in Figures 1 - 8. Furthermore, the deformations were measured for heat-treated, toothed-sleeves, the shape and the dimensions of which are shown in the sketch, Figure 9. In the latter case, the deformations were measured for local induction hardening and subsequent tempering in a furnace, after local induction hardening with self tempering and

Card1/3

after volume hardening and tempering by heating in the furnace. As regards reducing deformations, the best results were obtained in the case of surface hardening followed by self tempering. The following conclusions are arrived at: increase of the hardening temperature leads to an increase in the degree of deformation but does not affect the nature of the deformation. The influence of an increase in temperature is highest for the changes of the internal and external diameters and is less in the height of the specimens. In the case of surface induction hardening of important components, where it is necessary to maintain accurately the geometry and the dimensions in the process of heat treatment, particular attention must be paid to adhering to the optimum heating temperature during the hardening process. The highest hardening deformation is obtained in the case of cooling in water and the deformation is less in the case of cooling in oil. The deformation is somewhat smaller if the quenching is effected in a 30% solution of glycerin and a 5% solution of $KMnO_4$. However, the most important

advantage of these quenching media is the prevention of crack formation. Preliminary heat treatment brings about some decrease in the deformation during the hardening process. Low-temperature tempering of the surface of hardened steel leads to a reduction in its dimensions and therefore such tempering will partly compensate changes in the height and in the internal diameter and will bring about an increase in the change of the external diameter. There are 9 figures and 4 tables.

ASSOCIATION: TsNIITMASh

BOGATYREV, Yu.M.

Rapid electric induction heating of highly alloyed steel blanks. Kuz.-shtam.proizv. 1 no.12:36-43 D '59. (MIRA 13:4)

(Induction heating) (Metalwork)

NOVIKOV, V.N., kand.tekhn.nauk; BOGATYREV, Yu.M., kand.tekhn.nauk

Research in the field of electric heating and electic heat treatment. [Trudy] TSNIITMASH 89:5-17 '59. (MIRA 12:4)
(Induction heating) (Metals--Heat treatment)
(Metallurgical research)

BOGATYREV, Yu.M., kand.tekhn.nauk; RUMYANTSEVA, Ye.I., inzh.

Industrial use of induction heating in foreign countries. [Trudy] TSNIITMASH 89:17-19 '59. (MIRA 12:4)
(Induction heating)

BOGATYREV, Yu.M., kand.tekhn.nauk; PLESHACHKOVA, V.P., inzh.

Deformation of surface hardened steel. [Trudy] TSNIITMASH 89:70-86 '59. (MIRA 12:4)
(Deformations (Mechanics)) (Hard facing)
(Steel--Heat treatment)

BOGATYREV, Yu.M., kand.tekhn.nauk; GAMAZKOV, S.M., kand.tekhn.nauk

Electric tempering of surface hardened parts with consecutive heating. [Trudy] TSNIITMASH 89:116-130 '59. (MIRA 12:4)
(Case hardening) (Tempering) (Induction heating)

BOGATYREV, Yu.M., kand.tekhn.nauk

Structure and properties of steel subjected to electric heat in volume. [Trudy] TSNIITMASH 89:158-169 '59. (MIRA 12:4)
(Steel--Heat treatment) (Steel--Metallography)
(Induction heating)

GOROZHANKIN, A.N., kand.tekhn.nauk; NOVITSKIY, V.K., kand.tekhn.nauk; KRYANIN, I.R., doktor tekhn.nauk; IODKOVSKIY, S.A., kand.tekhn. nauk; LADYZHENSKIY, B.N., kand.tekhn.nauk; MIL'MAN, B.S., kand.tekhn. nauk; KLOCHNEV, N.I., kand.tekhn.nauk; TSYPIN, I.O., kand.tekhn. nauk; LEVIN, M.M., kand.tekhn.nauk; BALDOV, A.L., inzh.; LYASS, A.M., kand.tekhn.nauk; CHERNYAK, B.Z., kand.tekhn.nauk; ASTAF'YEV, A.A., kand.tekhn.nauk; YERMAKOV, K.A., inzh.; GRIBOYEDOV, Yu.N., kand.tekhn.nauk; MYASOYEDOV, A.N., inzh.; BOGATYREV, Yu.M., kand. tekhn.nauk; UNKSOV, Ye.P., doktor.tekhn.nauk, prof.; SHOFMAN, L.A., kand.tekhn.nauk; PERLIN, P.I., inzh.; MOSHNIN, Ye.N., kand.tekhn. nauk; PROZOROV, L.V., doktor tekhn.nauk; CHERNOVA, Z.I., tekhn. red.

[Some technological problems in the manufacture of heavy machinery] Nekotorye voprosy tekhnologii tiazhelogo mashinostroeniia. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry. Part 1. [Steel smelting and casting, founding, heat treatment, shaping metals by pressure] Vyplavka i razlivka stali, liteinoe proizvolstvo, termicheskaia obrabotka, obrabotka metallov davleniem. 1960. 266 p. (Moscow. Tsentral'nyi nauchno-issledovatel'skii institut tekhnologii i mashinostroeniia. [Trudy] no. 98). (MIRA 13:7)

(Steel) (Founding) (Forging)

BOGATYREV, Yu. V. (Moskva)

Technique of angiography of the cerebral vessels through the temporal artery. Vop.neirokhir. no.5:40-42 '61. (MIRA 14:11)

1. Instituta nervologii AMN SSSR.
(ANGIOGRAPHY)

Bogatyreva A.N.

A simple method of synthesis of 2-butene-1,4-diol. ... A. N. Bogatyreva.

with ... (d. 0.4) was covered with an aq. soln. of ... $Bi(NO_3)_3.5H_2O$, and HNO_3, boiled to dryness, and heated ... hrs. at 400° to convert the salts to oxides. The dry mass was sieved to pass through a 0.25-mm. sieve, mixed with formalin and powd. white marble (to neutralize the HCO_2H formed) and refluxed at 85-90° in a current of N which was gradually replaced with C_2H_2. ... lected on filter paper. A suspension of the powder in formalin was added dropwise in a flask filled with C_2H_2 or N and ... was ... 85-95°

Nauchno-issledovatel'skiy institut plasticheskikh mass.

BOGATYREVA, A.V.

SHMELEV, A.Ye., prof.; BELOUSOV, A.P., dotsent; KUDRYAVINA, T.A., kand. tekhn.nauk; FRUKTOV, V.V., inzh.; BOGATYREVA, A.V., inzh.

Introducing standard technological processes for machining parts in conditions of small-lot production. Trudy MIEI no.7:5-19 '57. (MIRA 10:12)

(Metal cutting) (Machine-shop practice)

BOGATYREVA, A. V.: Master Med Sci (diss) -- "Changes in the peripheral lymph nodes in psoriasis patients (Clinical-histological and experimental investigation)". Novosibirsk, 1959. 26 pp (Novosibirsk State Med Inst, Clinic of Dermatological and Venereal Diseases of the Novosibirsk State Med Inst, Clinic of Dermatological and Venereal Diseases of the Saratov State Med Inst), 250 copies (KL, No 14, 1959, 123)

BOGATYREVA, A.V.; GOLOVINA, A.A. (Novosibirsk)

Exudative-arthropathic form of psoriasis in combination with visceral, endocrine and neural disorders. Klin. med. 37 no.5: 144-146 My '59. (MIRA 12:8)

1. Iz kliniki kozhnykh i venericheskikh bolezney (zav. - prof. A.K. Yakubson) Novosibirskogo meditsinskogo instituta.
(PSORIASIS, case reports
exudative arthropathic form with visceral, endocrine & neural disord. (Rus))
(ENDOCRINE DISEASES, etiol. & pathogen.
psoriasis, exudative-arthropathic form (Rus))
(CENTRAL NERVOUS SYSTEM, dis.
caused by psoriasis, exudative-arthropathic form (Rus))

BOGATYREVA, A.V.

Changes in the peripheral lymph nodes in patients with psoriasis. Vest. derm. i ven. 34 no.4:15-21 '60. (MIRA 13:12)
(LYMPHATICS) (PSORIASIS)

BOGATYREVA, A.V.; GOLOVINA, A.A.

Exudative-arthropathic psoriasis associated with visceral, endocrine, and neural disorders. Vest.derm.i ven. 34 no.9:18-21 '60. (MIRA 13:11)

1. Iz kliniki kozhnykh vererichesikh bolezney Novosibirskogo meditsinskogo instituta (zav. - prof. A.K. Yakubson).
(PSORIASIS)

BOGATYREVA, A.V.

Treatment of onychomycoses with benzoic acid preparations.
Vest. derm. i ven. 37 no. 10:29-31 O '63. (MIRA 17:9)

1. Klinika kozhnykh bolezney (zav. - prof. A.K.Yakubson) Novosibirskogo meditsinskogo instituta.

BOGATYREVA, K.F.

"

New type of feeding sunflower - "fuksinka gor'kovskaia'
Korm. baza 2 no. 10, 1951

BYKOVA, I.V., st. nauchn. sotr.; STEPANOV, A.S., st. nauchn. sotr.; SOLOV'YEV, A.P.; AFANAS'YEVA, A.A., st. nauchn. sotr.; BOGATYREVA, L.M.; LIFENTSOVA, A.S.; SHUBA, L.S., red.; TIMOFEYEVA, Ye.A., red.

[Food product substitutes in the textile industry] Zameniteli pishchevykh produktov v tekstil'noi promyshlennosti. Moskva, 1963. 67 p. (MIRA 17:12)

1. Moscow. TSentral'nyy institut nauchno-tekhnicheskoy informatsii legkoy promyshlennosti. 2. Rukovoditel' laboratorii spetsial'noy otdelki Ivanovskogo nauchno-issledovatel'skogo instituta khlopchato-bumazhnoy promyshlennosti (for Solov'yev). 3. Ivanovskiy nauchno-issledovatel'skiy institut khlopchato-bumazhnoy promyshlennosti (for all except Shuba, Timofeyeva).

BOGATYREVA, L.M.

Use of acetone formaldehyde resins in the crease-resistant finishing of cotton fabrics. Nauch.-issl.trudy IvNITI 26:158-166 '63. (MIRA 18:4)

SOV/156-59-1-53/54

5(2), 18(7)

AUTHORS: Kochergin , V. P., Bogatyreva, N. Ye.

TITLE: The Dissolution of Iron in Fusions Which Contain Lithium Chloride and Sulphates of Alkali- and Alkaline Earth Metals (Rastvoreniye zheleza v rasplavakh, soderzhashchikh khlorid litiya i sul'faty shchelochnykh i shchelochnozemel'nykh metallov)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1959, Nr 1, pp 2o6 - 2o9 (USSR)

ABSTRACT: An investigation is made into the corrosion of iron in non-dehydrated fusions of : LiCl + Na_2SO_4, LiCl + K_2SO_4, LiCl + $CaSO_4$, and LiCl + $MgSO_4$. The course of the solution process as a function of time and temperature is represented in diagrams. On the corrosion in chloride fusions (without sulphates) it was found that the dissolution of iron is connected with the occurrence of H^+-ions: $Fe+2H^+ = H_2 + Fe^{2+}$. The H^+-ions are formed in the fusions

Card 1/3

The Dissolution of Iron in Fusions Which Contain Lithium Chloride and Sulphates of Alkali- and Alkaline Earth Metals SOV/156-59-1-53/54

by the hydrolysis of the salts in water traces. If a high vacuum is used, and if the residual water is removed beforehand, corrosion does not occur. In the presence of sulphates, however, it is not only the H^+-ions that have a corrosive effect, but SO_4^{2-} -ions also appear in this process. The reaction $3Fe + SO_4^{2-} = Fe_3O_4 + S^{2-}$ was demonstrated by an x-ray investigation of the oxidation products. Here too, at any rate, the corrosion rate was reduced after the removal of the water traces and on treating a high vacuum. Contrary to the views of other authors on the oxidizing effect of atmospheric oxygen, the blowing of dry air through the fusions showed a lowering of the corrosion rate. Apparently air removes the water traces, whereas oxygen, due to its poor solubility, remains ineffective in the fusion. There are 4 figures and 12 references, 10 of which are Soviet.

Card 2/3

The Dissolution of Iron in Fusions Which Contain Lithium Chloride and Sulphates of Alkali- and Alkaline Earth Metals

SOV/156-59-1-53/54

ASSOCIATION: Kafedra neorganicheskoy khimii Ural'skogo gosudarstvennogo universiteta im. A. M. Gor'kogo (Chair of Inorganic Chemistry of Ural State University imeni A. M. Gor'kiy)

SUBMITTED: June 26, 1958

Card 3/3

БОГАТЫРЕВА, С.

YAKOBSON, V.; SHAVRA, V.; BOGATYREVA, S.

Operation of small automatic ammonia refrigerating plants. Khol. tekh. 34 no.4:12-17 O-D '57. (MIRA 11:1)
(Refrigeration and refrigerating machinery)

BOGATYREVA, S.

Hard worker, educator, innovator. Izobr. i rats. no.3:42-44 Mr '61.
(MIRA 14:3)
(Khot'kovo—Electric insulators and insulation)

SIZOV, A.P.; KONOPLYANNIKOV, Yu.A.; BOGATYREVA, S., red.

[Electric spark machining of metals; review of foreign patents] Elektroerozionnaia obrabotka metallov; obzor inostrannykh patentov. Moskva, TSentr. nauchno-issl. in-t patentnoi informatsii i tekhniko-ekon. issledovanii, 1964. 46 p. (MIRA 18:6)

TIMAKOV, V.D.; KUDLAY, D.G.; PETROVSKAYA, V.G.; KORNEYEVA, A.M.; BOGATYREVA, S.A.

Comparative immunochemical investigations on Salmonella typyosa of various degrees of virulence. Zhur.mikrobiol.epid. i immun. 30 no.2: 23-29 F '59. (MIRA 12:3)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR i kafedry biokhimii rasteniy Moskovskogo universiteta imeni Lomonosova.

(SALMONELLA TYPHOSA,
immuno-chem. aspects of strains with various degrees of virulence (Rus))

KUSHNER, Kh.F.; TOLOKONNIKOVA, Ye.V.; MOISEYEVA, I.G.; BOGATYREVA, S.A.; ZNAMENSKAYA, M.P.

Introduction of heterologous desoxyribonucleic acid in hens. Trudy Inst. gen. no.28:350-358 '61. (MIRA 14:11)
(DESOXYRIBONUCLEIC ACID) (POULTRY)

TOLOKONNIKOVA, Ye.V.; MOISEYEVA, I.G.; BOGATYREVA, S.A.

Changes in the color of feathers in the progeny of hens resulting from the transfusion of different components of alien blood. Zhur. ob. biol. 22 no.1:66-73 Ja-F '61. (MIRA 14:1)

1. Institute of Genetics, U.S.S.R. Academy of Sciences.
(BLOOD—TRANSFUSION) (COLOR OF BIRDS)

BOGATYREVA, S.A.; ZNAMENSKAYA, M.P.; KUSHNER, Kh.F.; MOISEYEVA, I.G.; TOLOKONNIKOVA, Ye.V.

Introduction of foreign desoxyribonucleic acid into the organism of a hen. Dokl.AN SSSR 136 no.5:1213-1215 F '61. (MIRA 14:5)

1. Institut biokhimii im. A.N.Bakha AN SSSR i Institut genetiki AN SSSR. Predstavleno akad. N.M.Sisakyanom.
(Desoxyribonucleic acid) (Poultry)

BOGATYREVA, S.A.; ZNAMENSKAYA, M.P.

Changes in the properties of desoxyribonucleic acid during its interaction with ascorbic acid. Dokl. AN SSSR 140 no.1:236-239 S-O '61. (MIRA 14:9)

1. Institut biokhimii im. A.N.Bakha AN SSSR. Predstavleno akademikom A.I.Oparinym.
(DESOXYRIBONUCLEIC ACID) (ASCORBIC ACID)

05730

28 (5), 18 (7)

AUTHORS: Tolstaya, M. A., Bogatyreva, S. V., Gradusov, G. N.

SOV/32-25-10-19/63

TITLE: Removal of Corrosion Products From Various Steels

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 10, pp 1205 - 1206 (USSR)

ABSTRACT: A valuation of the corrosion resistance of corrosion-resistant steels in tests in pure water at high temperatures is rather difficult since the corrosion rate is low. The method of cathodic removal of test samples in appropriate media is most favorable. To find a reliable method, a cathodic removal to a constant weight, and comparative experiments by ordinary removal in acids with delayers, were carried out in the present case. Plane and cylindric samples with surfaces of 10-20 cm and a weight of 8-15 g were tested in a special device (Figure). The loss in weight after the cathodic removal was 0.0010-0.0030 g for stainless steel, and 0.0050-0.0200 g for carbon steel. The corrosion products of the austenitic stainless steel represented a more or less dense velvetlike film of magnetite with admixtures of nickel- and chromium oxides, under which there was a second oxide film that could not be removed. The first-men-

Card 1/2

tioned oxide film could be detached by cathodic removal in 2.5% H_2SO_4 with urotropine (as a delayer), as well as 5% H_2SO_4 with 5-6 g/l of urotropine, at 65-70° and a current density of 0.1-0.2 a/cm^2 in 40-60 minutes. The corrosion products of the carbon steel represented a thick, black magnetite film with poor adhesion to the metal surface which was easily removed in the alkaline medium (8% NaOH). Thus, the corrosion of austenitic stainless, carbo[illegible] and poorly or medium-alloyed steels in water at high temperatures can be rated by the loss in weight of the sample after cathodic removal in different media. There are 1 figure and 1 Soviet reference.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Engineering Institute)

18.8300

S/096/60/000/010/020/022
E194/E135

AUTHORS: Tolstaya, M.A., Gradusov, G.N., and Bogatyreva, S.V.

TITLE: The Corrosion Resistance of Zirconium Alloys in Water at High Temperatures

PERIODICAL: Teploenergetika, 1960, No 10, p 95

TEXT: Tubular specimens were tested at temperatures of 263 °C (50 atm) and 310 °C (100 atm) in pure water and in water containing chlorine ions (10 mg/litre) for 2300 hours. It was established that the corrosion rate was greatly influenced by the quality of the surface treatment of the specimen and by contact with teflon linings. The other factors investigated did not affect the rate of corrosion.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Institute)

Card 1/1

BOGATYREVA, S.V.

36

PHASE I BOOK EXPLOITATION SOV/5256

Gerasimov, Valentin Vladimirovich, ed., Candidate of Chemical Sciences.

Korroziya reaktornykh materialov; sbornik statey (Corrosion of Nuclear-Reactor Materials; a Collection of Articles)' Moscow, Atomizdat, 1960. 284 p. 3,700 copies printed.

Ed.: A.I. Zavodchikova; Tech. Ed.: Ye.I. Mazel'.

PURPOSE: This collection of articles is intended for mechanical and metallurgical engineers as well as for scientific research workers concerned with the construction of nuclear reactors.

COVERAGE: The water corrosion of various types of stainless steel and alloys under high pressures and temperatures is investigated from the point of view of the use of these materials for the construction of nuclear reactors. Attention is given to the following: the use of oxygen for protecting steel against corrosion, the behavior of steel in high-temperature

Card ~~1/8~~

water with various compositions, factors of metal stress corrosion, intergranular corrosion, the mechanism of corrosion cracking, and the corrosion resistance of aluminum and zirconium alloys. Conclusions based on test results are included. No personalities are mentioned. Most of the articles are accompanied by references. Of 238 references 97 are Soviet.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress (TA462.G4)

VK/wrc/bc
10-12-61

Card 9/9

18.8300

29039
S/081/61/000/018/015/027
B103/B101

AUTHORS: Tolstaya, M. A., Gradusov, G. N., Bogatyreva, S. V.

TITLE: Effect of electropolishing on the corrosion resistance of 1Х18Н9Т steel and carbon steel 20 in water at high temperatures

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 18, 1961, 271, abstract 18I165 (Sb. "Korroziya reaktorn. materialov" M., Atomizdat, 1960, 167 - 184)

TEXT: Corrosion tests of 1Х18Н9Т (1Kh18N9T) steel, steel with 5% Cr and 2% Mo content, and Ст.20 (St.20) carbon steel were conducted to study the effect of surface treatment on kinetics and rate of corrosion (RC) of the steels in highly pure (HP) water at high parameters (310°C and 100 atm) during 100-1500 hr. The effects of electropolishing, cathodic pickling, and mechanical polishing were studied. It is pointed out that alloying of steel with Cr in amounts of <12° is not capable of making corrosion-resistant steels that remain serviceable under the action of HP H_2O. It

Card 1/2

29039
S/081/61/000/018/015/027
B103/B101

Effect of electropolishing...

was found that the principal inhibitory effect on RC of steels in HP water at high parameters did not originate in the oxide layer removable by cleaning but in the subjacent fine oxide film inseparable from the metal surface. [Abstracter's note: Complete translation.]

Card 2/2

18.8300

28570 S/137/61/000/009/083/087
A060/A101

AUTHORS: Tolstaya, M. A., Gradusov, G. N., Bogatyreva, S. V.

TITLE: Investigation of the corrosion mechanism in zirconium alloys alloyed with niobium in high-purity water

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 9, 1961, 55, abstract 9I374 (V sb. "Korroziya reaktorn. materialov". Moscow, Atomizdat, 1960, 250-263)

TEXT: The corrosion mechanism was investigated in Zr-alloys containing 1 and 2.5% Nb in water of high purity at a temperature of 90°C saturated with various gases (O, N, air, and H). The corrosion of the Zr-Nb alloy under these conditions is arrested by the passivation of the metal and by the formation of a strong protective film. The effectiveness of the cathodic process is mainly determined by the rate of O ionization, and not by the intensity of its diffusion in the metal. The corrosion rate of Zr alloys depends little upon the quantity of O in the water. The determining factor of inhibition in this process remains the passivation of the metal. The presence of H in the water affects the corrosion of Zr alloys little. The presence of contacts between the Zr alloy

Card 1/2

28570 S/137/61/000/009/083/087
A060/A101

Investigation of the corrosion mechanism ...

and steel 1Kh18N9T (1Kh18N9T) in water of high purity presents no danger. Defects in the metal surface, the presence in the water of compounds forming complexes with Zr, activate the Zr and raise the corrosion rate. There are 9 references.

Ye. Layner

[Abstracter's note: Complete translation]

Card 2/2

28313
S/081/61/000/016/021/040
B106/B101

18.8300

AUTHORS: Tolstaya, M. A., Gradusov, G. N., Bogatyreva, S. V.

TITLE: Study of the corrosion resistance of zirconium-alloy tubes in water at high temperatures

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 16, 1961, 305-306, abstract 16И167 (Sb. "Korroziya reaktorn. materialov". M., Atomizdat, 1960, 264-274)

TEXT: It was found that the corrosion rate of Zr alloyed with Nb, in water at 263-310°C and at pressures of 50-100 atm is 0.0016-0.0020 $g/m^2 \cdot hr$ or 0.0021-0.0027 mm per year. It is pointed out that a rough surface treatment of the alloy accelerates the detachment of the protective skin and favors the corrosion. The occurrence of fluorine ions on the metal surface after its etching increases the corrosion rate of zirconium and its alloys. [Abstracter's note: Complete translation.]

Card 1/1

S/081/61/000/020/059/089
B102/B147

AUTHORS: Tolstaya, M. A., Bogatyreva, S. V., Gradusov, G. N.

TITLE: Removal of corrosion products from steels after testing in water at high temperatures

PERICDICAL: Referativnyy zhurnal. Khimiya, no. 20, 1961, 263, abstract 20I190 (Sb. "Korroziya reaktorn. materialov". M., Atomizdat, 1960, 20 - 28)

TEXT: In order to remove corrosion products formed under the action of water at high temperatures it is recommended that the method of cathodic treatment should be used for austenitic stainless steel specimens at different temperatures and at D_c = 0.1 - 0.2 a/cm^2 until constant weight is reached in 2.5 - 5.0% H_2SO_4 solution with Urotropin as a corrosion inhibitor. Treatment in 8% NaOH solution at 70°C and at D_c = 0.05 - 0.1 a/cm^2 is recommended for carbon steels. It is noted that control specimens should be treated under optimum conditions. [Abstracter's note: Complete

Card 1/2

Removal of corrosion products...

translation.]

S/081/61/000/020/059/089
B102/B147

Card 2/2

18.8310 1138, 1454, 1573

S/089/61/010/003/002/021
B108/B209

AUTHORS: Tolstaya, M. A., Bogatyreva, S. V., Gradusov, G. N.

TITLE: Resistance of steels and zirconium alloys to corrosion in solutions of boric acid at different temperatures

PERIODICAL: Atomnaya energiya, v. 10, no. 3, 1961, 222-226

TEXT: For an emergency stop of water-cooled water-moderated reactors, boric acid solution with a boron concentration of about 1 g/l may be introduced into the water of the first circuit. Such a system is, for instance, installed in the "Yankee" nuclear power station. It was the aim of the present work to examine the influence of boric acid solutions upon the corrosion resistance of the structural materials of the first circuit in a water-cooled water-moderated reactor. The specimens were parts of tubes and plates of 1Kh18N9T (1Kh18N9T)-type steel, steel 20, and zirconium alloys containing 1 and 2.5% niobium. The surface of the specimens was subjected to electropolishing, mechanical polishing, and etching. These experiments were carried out under static conditions in

Resistance of steels and zirconium ...

an autoclave of stainless 1Kh18N9T steel at pressures between 100 and 140 atm and at saturation temperature. In other experiments made at 40°C and atmospheric pressure, specimens were studied simultaneously in boric acid solution and highly pure water. The specimens were plates of steel of the types 1Kh18N9T, OX13 (OKh13), X5M2 (Kh5M2), and 20, as well as of zirconium with 2.5% niobium. The solutions were analyzed for their boron content by colorimetric photometry with carmine red as indicator. Moreover, the penetration of boron into the metals was studied spectrographically, by removing 0.05-0.1 mm thick shavings from the surface which had been carefully rinsed. The rate of corrosion was determined by weighing the specimens with an accuracy of 0.1 mg. The steel specimens showed a decrease in weight after the corrosion products had been removed; the corrosion rate of the zirconium alloys was determined from the excess weight of the specimens. Table 1 shows the rates of corrosion in boric acid solutions with a pH of 5.8-5.5 at 335°C and 140 atm. In solutions of higher H_3BO_3 concentration (5.65 g/l) with a pH of 5.2, a temperature of 310°C and a pressure of 100 atm, an investigation for 150 hrs gave the following results: The rate of corrosion of

Card 2/4

1Kh18N9T steel was nearly the same as that shown in Table 2 when converted to 1000 hrs. At 40°C, carbon steel 20 was considerably affected by pure water and by the acid, thus forming crumbly corrosion products. Kh5M2-type steel corroded more slowly than carbon steel. The corrosion of OKh13-type ferrite steel was insignificant in both media. Spectrographic analysis showed that boron did not penetrate into the steel. Zirconium alloys, however, adsorb boron from high-parameter boric acid solutions, so that the boron content exceeds the admissible concentration in the alloy by 2-3 orders of magnitude. Boron obviously takes root in the ZrO_2 surface layer of zirconium alloys during corrosion in high-parameter solutions. The results show that boric acid solutions may be used for "soft" reactor control. An emergency injection of boric acid must not damage the materials of the first circuit. Boric acid does not decompose in pure water. OKh13-type ferrite steel is recommended for the construction of storing tanks. There are 4 tables and 4 references: 3 Soviet-bloc.

SUBMITTED: June 6, 1960

Card 3/4

Resistance of steels and zirconium ...

Legend to Table 1: Corrosion rate, $g/m^2.hr$. 1) 1Kh18N9T-type steel; 2) zirconium alloy with 2.5% niobium; 3) zirconium alloy with 1% niobium; 4) steel 20. A) Highly pure water; B) pure water + 0.23 g/l H_3BO_3; C) pure water + 1.13 g/l H_3BO_3. a) No treatment; b) mechanically polished; c) electropolished; d) polished and etched (with 5% concentrated HF, 45% concentrated HNO_3, 50% water).

	вода высокой чистоты A)	вода высокой чистоты с добавкой 0,23 г/л H_3BO_3 B)	вода высокой чистоты с добавкой 1,13 г/л H_3BO_3 C)
1)	0,0005 a) 0,0003 b) 0,0001 c)	0,0007 0,0009 0,0002	0,0007 0,0008 0,0006
2)	0,0011 a) 0,0013 c)	0,0011 0,0012	0,0015 0,0016
3)	0,0008 d) 0,0015 b)	0,0010 0,0014	0,0009 0,0011
4)	0,0040 a) 0,0019 c) — b)	0,0037 0,0019 0,0035	0,0041 0,0021 0,0038

Table 1

Card 4/4

TOLSTAYA, M.A.; GRADUSOV, G.N.; BOGATYREVA, S.V.

[Effect of electrolytic polishing on the corrosion resistance of 1Kh18N9T steel and of carbon steel 20, in water at high temperatures] Vliianie elektropolirovki na korrozionnuiu stoikost' stali 1Kh18N9T i uglerodistoi stali-20 v vode pri vysokikh temperaturakh. Moskva, Glav.upr. po ispol'zovaniiu atomnoi energii, 1960. 14 p. (MIRA 17:1)

(Steel--Corrosion)
(Electrolytic polishing)

L 38256-66 EWT(m)/EWP(e) WH

ACC NR: AP6028678 SOURCE CODE: UR/0104/66/000/005/0070/0074

AUTHOR: Kozhukhov, V. K. (Candidate of technical sciences); Bogatyreva, T. A. (Engineer); Buneyeva, L. N. (Candidate of technical sciences); Pototskaya, G. B. (Engineer); Matveyeva, G. L. (Engineer); Glushchenko, V. N. (Engineer)

ORG: none

TITLE: Suspended insulators for 750-Kv lines

SOURCE: Elektricheskiye stantsii, no. 5, 1966, 70-74

TOPIC TAGS: insulating material, high voltage line, glass product, glass property

ABSTRACT: New insulators, made of low-alkali glass, will allow 750-kv lines to be suspended from a single chain of insulators per pole or mast, simplifying the installation of the lines. The insulators have a guaranteed electromechanical strength of 30 t. It was determined that 27-28 elements in a chain are sufficient for usage in 750 kv lines. They can also be used in case of lower voltages where high mechanical strength is required, such as river crossings, etc. The technology of hand pressing of the glass parts has been so developed that mechanized production is possible. Improvements should be made in two areas: increasing the length of the leakage path for usage in regions with high polution and reduction of the height of the insulator and head diameter (by using cylindrical heads, rather than the conical heads now used). Orig. art. has: 5 figures and 1 table. [JPRS: 36,501]

SUB CODE: 13, 11 / SUBM DATE: none

Card 1/1 MLP UDC: 621.513.624.001.5

L 10396-67 EWT(m)/EWP(j) LJP(c) RM

ACC NR: AP7003119 SOURCE CODE: UR/0080/66/039/007/1572/1576

46

BOGATYREVA, T. K., KAPUSTINA, A. S., KIRPICHNIKOV, P. A., TIKHOVA, N. V., and YANOVSKIY, D. M.

ORG: none

"Stabilization of Polyvinylchloride by Esters of 1,2-Epoxy-1-phenylethylphosphinic and 1,2-Epoxypropylphosphinic Acids. Report 2"

Moscow, Zhurnal Prikladnoy Khimii, Vol 39, No 7, Jul 66, pp 1572-1576

Abstract: The esters of 1,2-epoxy-2-propylphosphinic acid are known to inhibit the thermal decomposition of polyvinylchloride (PVC). The effect of esters of phosphinic acid with the following general formula on the thermal decomposition of PVC was studied to further investigate the stabilizing action of organophosphorus compounds:

$(RO)_2$-P(=O)-CH_2-CH_3 and $(RO)_2$-P(=O)-C(R')(O)-CH_2

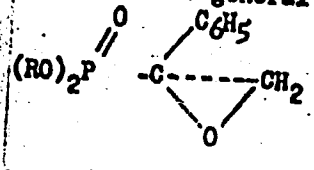
where R = alkyl group, R' = CH_3 or C_6H_5.

Card 1/2

L 10396-67

ACC NR: AP7003119

The previously undescribed esters of 1,2-epoxy-1-phenylethylphosphinic acid with the general formula



where R = CH_3, C_2H_5, iso-C_3H_7, iso-C_4H_9, or iso-C_5H_{11}, were obtained by the dehydrochlorination of the esters of alpha-hydroxy-alpha-phenyl-beta-chloroethylphosphinic acid.

The stabilizing effect of the esters studied during the thermal decomposition of PVC depends on their structure and on the experimental conditions.

The nature of the esters of 1,2-epoxy-1-phenylphosphinic and 1,2-epoxy-2-propylphosphinic acids in the stabilizing action on the thermal decomposition of PVC was established.

It was shown that the action of the esters is determined by the strength of the carbon-phosphorus bond, and the effect on the stability of the ester molecule depends on the nature of the radical connected to the carbon epoxy ring.

Orig. art. has: 1 figure and 2 tables. [JPRS: 38,970]

TOPIC TAGS: polyvinyl chloride, ester, phosphinic acid, thermal decomposition

SUB CODE: 07 / SUBM DATE: 09Jun64 / ORIG REF: 003 / OTH REF: 001

Card 2/2 bm

BOGATYREVA, V.I.

COUNTRY	:	USSR V
CATEGORY	:	Pharmacology and Toxicology. Analeptics
ABS. JOUR.	:	RZhBiol., No. 5 1959, No. 23053
AUTHOR	:	Vaksleyger, G.A.; Bogatyreva, V.I.; Nasledkov, V.N.
INST.	:	-
TITLE	:	Influence of Caffeine and Bromine upon Reflex Excitability of the Respiration Center
ORIG. PUB.	:	Fiziol. zh. SSSR, 1958, 44, No 5, 433-437
ABSTRACT	:	Changes of excitability of the respiration center (RC) under the influence of small and medium doses of caffeine (C) introduced subcutaneously was studied on dogs with a weak and strong type of nervous system. Reflex excitability of RC was determined by means of tetanizing irritation of the vagus nerve. Under the influence of C, reflex excitability of RC invariably increased; at the same time, for dogs of weak nervous type a smaller dose was needed for this purpose than

Card: 1/3

COUNTRY :
CATEGORY : V

ABS. JOUR. : RZhBiol., No. 5 1959, No. 23053

AUTHOR :
INST. :
TITLE :

ORIG. PUB. :

ABSTRACT : for dogs of the strong type. A summation of the
cont'd action of C after introduction of its repeated doses was observed, which was expressed in the gradual increase of the excitability of RC. The changes in respiration occurring as a result of the introduction of C are explained by its direct action on RC since this action was also observed in dogs deprived of the cerebral cortex. The ac-

Card: 2/3

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000205810017-7"

18 831D

25081
S/081/61/000/010/015/029
B117/B206

AUTHORS: Balezin, S. A., Bogatyreva, V. I.

TITLE: Effect of organic inhibitors on the electrode potential of steel

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 10, 1961, 299, abstract 10 M 232 (10I232). ("[Uch.zap.] Mosk. gos. ped. in-ta im. V. I. Lenina", no. 146, 1960, 159-169)

TEXT: The investigation of the electrode potentials of steel with respect to time was made in distilled and tap water, in 0.1 N NaCl standard solutions with various admixtures of Na salts of phenyl acetic, benzoic, salicylic, anthranilic, and phthalic acids. It was established that the initial electrode potentials are shifted in positive direction in electrolytes with admixtures of salts of aromatic acids. It was also found that the electrochemical mechanism of sodium benzoate and sodium phenyl acetate has an inhibiting effect mainly on anodic processes. [Abstracter's note: Complete translation.]

Card 1/1

8720. Sham and normal drinking in different [illegible]

I. Bogatyreva Trud. Voronezh. [illegible]

[illegible] by [illegible]

[illegible] alimentary [illegible]

[illegible] through the [illegible]

[illegible] mechanism [illegible] relieving [illegible]

BOGATYREVA, V.V.; VEYNBERG, V.B.; MAL'TSEV, Yu.V.; MEYNGARD, P.N.

Doublet focal mirror-lens monochromators. Opt.-mekh.prom. 25 no.5:16 My '58. (MIRA 11:9)
(Monochromators)

5(2,3)

AUTHORS: Bogatyreva, Ye. V., Balezin, S. A. SOV/153-2-1-5/25

TITLE: Phenyl Acetic Acid Sodium as a Corrosion Inhibitor for Metals in Neutral Media (Feniluksusnokislyy natriy kak zamedlitel' korrozii metallov v neytral'nykh sredakh)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 1, pp 25-29 (USSR)

ABSTRACT: The most efficient inorganic inhibitors (passivators) (Ref 1) exhibit several considerable deficiencies, though wide use is made of them in industries. Either they are poisonous or lead to corrosion at insufficiently low concentrations, etc. These deficiencies are not to be found in some salts of benzoic acid (Refs 2 - 4) and phenyl acetic acid. The properties of the last-mentioned substance have not yet been studied. The authors investigated the above-mentioned subject by using steel in distilled and tap water at natural and increased aeration (for the container see figure 1), as well as in a medium without oxygen (Table 3) in dependence of temperature (Fig 5), of the pH values (Fig 6), and of the presence of Cl^--, SO_4^{2-}- or NO_3^- ions (Table 2).

Table 1 shows the lowest protective concentrations of sodium

Card 1/3

phenyl acetate in the two kinds of water mentioned above, which resulted after a duration of the experiments of eight months. The corrosion samples are contained in figures 2, 4, and 7. Figure 3 shows the dependence of the rate of corrosion of the steel 10 on the logarithm of the concentration of sodium phenyl acetate in both kinds of water. On the basis of the results the authors arrived at the following conclusions: (1) Sodium phenyl acetate decelerates the corrosion in distilled and tap water in the case of steel, chromium-plated and nickeled steel products, tin-plate with bare iron edge, and steel in contact with Al and Cu. Further, the authors determined the minimum protective concentrations of sodium phenyl acetate holding for these products. (2) This salt belongs to the group of harmless ("mild") decelerators. In the case of low concentrations it does not stimulate the corrosion. (3) The salt under consideration ensures the protection of steel along the water line if the workpiece is partially dipped into the solution. (4) In the presence of the afore-mentioned ions the protective properties of this salt deteriorate. In this connection the authors determined the lowest protective concentrations for steel in 0.001 m, 0.01 m, and 0.1 m solutions of NaCl, Na_2SO_4, and $NaNO_3$.

(5) At higher temperatures the protective properties of the salt deteriorate. Its minimum protective concentrations for temperatures of between 20 and 100° were ascertained. (6) Perfect protection of steel is ensured in solutions with a pH value of 5. (7) Increased aeration plays a double part: a) the minimum protective concentration of the inhibitor is lowered; b) this salt passes to the type of "harmful" inhibitor which cause removing corrosion of steel, that is, at concentrations which do not suffice for perfect protection of steel in distilled water. There are 6 figures, 3 tables, and 9 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy pedagogicheskiy institut imeni V. I. Lenina; Kafedra obshchey i analiticheskoy khimii (Moscow State Pedagogical Institute imeni V. I. Lenin, Chair of General and Analytical Chemistry)

SUBMITTED: October 26, 1957

5(2) SOV/80-32-5-25/52

AUTHORS: Bogatyreva, Ye.V., Balezin, S.A.

TITLE: Sodium Salicylate as Inhibitor of Steel Corrosion in Neutral Media

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol 32, Nr 5, pp 1071-1076 (USSR)

ABSTRACT: The change of the protective properties of the salts of benzoic acid after introduction of a hydroxyl group in its benzene ring are studied here. The sodium salt of the salicylic acid with the hydroxyl group in ortho-position was used for this purpose. Experiments conducted in distilled and waterpipe water at 18-20°C have shown that sodium salicylate and benzoate are inhibitors of corrosion. A higher concentration ofsalicylate is needed in order to obtain the same protection. The protection decreases with the increase of carbon in the steel. At higher temperatures the protective films are broken or dissolved, which also reduces the protective properties. In this case the concentration must be increased. Benzoate is active in the temperature interval 20-100°C, but salicylate only at 20-60°C. The presence of Cl', SO_4'' or NO_3' ions in distilled water reduces the protection and makes a higher concentration of the inhibitors necessary. Forced aeration has a double effect: it increases the protection by a

Card 1/2

Sodium Salicylate as Inhibitor of Steel Corrosion in Neutral Media

higher supply of inhibitor to the surface of the metal; but at insufficient concentration of the inhibitor, it increases corrosion by a higher supply of oxygen to unprotected parts. Salicylate has protective properties at pH 6, and benzoate at pH 5.5. The presence of oxygen is necessary for protection. In an oxygen-free atmosphere they loose their protective properties.
There are: 4 tables, 1 graph and 7 references, 1 of which is Soviet and 6 English.

SUBMITTED: November 30, 1957

Card 2/2

BOGATYREVA, Ye. V., Cand Chem Sci (diss) -- "The salts of certain aromatic acids as inhibitors of metal corrosion in neutral media". Moscow, 1960. 18 pp (Moscow State Pedagogical Inst im V. I. Lenin), 220 copies (KL, No 9, 1960, 122)

BOGATYREVA, Ye.V.; BALEZIN, S.A.

Organic inhibitors of metal corrosion in neutral media. Uch. zap. MGPI no.146:147-153 '60. (MIRA 15:4)
(Corrosion and anticorrosives)

BALEZIN, S.A.; BOGATYREVA, Ye.V.

Effect of organic inhibitors on the electrode potential of steel.
Uch. zap. MGPI no.146:159-169 '60. (MIRA 15:4)
(Inhibition (Chemistry)) (Steel) (Solubility)

BOGATYREVA, Ye.V.

Corrosion inhibiting effect of salts of some organic acids. Izv. vys.ucheb.zav.; khim.i khim.tekh. 4 no.6:1030-1034 '61. (MIRA 15:3)

1. Udmurtskiy gosudarstvennyy pedagogicheskiy institut, kafedra obshchey khimii.

(Corrosion and anticorrosives) (Acids, Organic)

BOGATYREVA, Ye.V.

Protective action of oxalate ions in aqueous media. Zhur. prikl. khim. 34 no.2:382-386 F '61. (MIRA 14:2)
(Oxalates) (Corrosion and anticorrosives)

188310

25085

S/081/61/000/010/022/029
B117/B203

AUTHORS: Bogatyreva, Ye. V., Balezin, S. A.

TITLE: Organic inhibitors of metal corrosion in neutral media

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 10, 1961, 290, abstract 10И243 (10I243). ([Uch. zap.] Mosk. gos. ped. in-ta im. V. I. Lenina, no. 146, 1960, 147-153)

TEXT: It was found that sodium benzoate- and sodium phenyl acetate buffer solutions with pH 7 inhibit the corrosion of steel- and iron anodes in the following contacts: steel - aluminum, steel - copper, steel - nickel, steel - chromium, iron - tin. It is noted that the effect of sodium salicylate, sodium anthranilate, sodium phthalate, and sodium phenyl acetate is identical to that of sodium benzoate. [Abstracter's note: Complete translation.]

X

Card 1/1

S/153/61/004/006/008/008
E134/E453

AUTHOR: Bogatyreva, Ye.V.

TITLE: The inhibiting effect of the salts of some organic acids

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, v.4, no.6, 1961, 1030-1034

TEXT: In addition to various inorganic salts, such as nitrites, chromates and phosphates, a whole range of organic inhibitors is known to protect steel against corrosion in neutral solutions. The present study is concerned with an investigation of the inhibiting properties of sodium acetate and oxalate in relation to steel in mains and distilled water. The samples were fully immersed in solutions which had their natural equilibrium air content. The experimental work was carried out as described previously, in a temperature range of 18 to 21°C. The corrosion process was followed by weighing. Sodium acetate and oxalate were to be corrosion inhibitors; 0.035 molar solutions were

S/153/61/004/006/008/008
E134/E453

The inhibiting effect ...

found to give full protection to the various steels tried. The quantities of sodium oxalate for full inhibition were generally 2 to 5 times higher than those of acetate. It was shown that the carbon content of the steels affects the inhibiting efficiency of the solutions. It is suggested that higher carbon content makes the surface less uniform and that higher inhibitor concentrations are necessary to suppress the "cementite-iron" micro galvanic cells. An investigation of the corrosion rates at different inhibitor concentrations shows highest rates at very low concentrations (curves given); inadequate protection can, therefore, be dangerous. The character of the curves remains constant with changes of the corrosive medium, only the corrosion rates and inhibitor-concentration required for full protection vary: e.g. corrosion rate and protective concentration are lower in distilled than in mains water. It was previously known that iron reacts with water free of oxygen, forming hydrogen and hydrated iron oxide. The effect of oxalate and acetate ions on corrosion of steel in water free of air was studied and the rate was found to increase with increasing ion concentration (curves given).

Card 2/3

This confirmed previous reports on the absence of inhibiting properties of acetate and oxalate ions in de-aerated water. An investigation of the effect of pH in the range of 1 to 8 was carried out using inhibitor concentrations of 0.05 g ions/litre distilled water. The solutions were prepared by titrating 0.05 molar acid solutions with sodium hydroxide. A control experiment was carried out in distilled water free of inhibitors at pH 6.4, and visual examination of the sample showed complete corrosion after 30 days. A complete table of corrosion rates in the inhibitor solutions at differing pH is given. Full protection is obtained at a pH of 7 or over. In the presence of acetate, corrosion rate decreases with increasing pH, but with oxalate the maximum corrosion rate was found at pH 5. An attempt is made to explain this apparent anomaly by reference to the chemical nature of the corrosion products. There are 2 figures and 2 tables.

ASSOCIATION: Udmurtskiy gosudarstvennyy pedagogicheskiy institut Kafedra obshchey khimii (Udmurt State Pedagogical Institute, Department of General Chemistry)

SUBMITTED: June 15, 1960

BOGATYREVA, Ye.V.; NAGAYEV, V.V.

Inhibiting action of sodium cinnamate in neutral media. Zhur.-prikl.khim. 35 no.3:550-553 Mr '62. (MIRA 15:4)
(Corrosion and anticorrosives) (Cinnamic acid)

ACCESSION NR: AR3000206 S/0081/63/000/006/0403/0403

SOURCE: RZh. Khimiya, Abs. 6K100

AUTHOR: Balezin, S. A.; Bogatyreva, Ye. V.

TITLE: Salts of some aromatic acids as inhibitors of corrosion of metals in neutral media

CITED SOURCE: Sb. tr. Voronezhk. otd. Vses. khim. o-va im. D. I. Mendeleyeva, vyp. 2, 1959, 97-104

TOPIC TAGS: Salts, aromatic acids, corrosion inhibitors, metals

TRANSLATION: A study was made of the Na-salts of benzoic, phenylacetic, salicylic, anthranilic, and phthalic acid as harmless inhibitors of corrosion (IC) of steel in water. It was found that best IC of steel in water are sodium benzoate and sodium phenylacetate. The presence of functional groups (-COO sup -, NH sub 2, - OH) in salts of aromatic acids de-

Card 1/3

ACCESSION NR: AR3000206

creases the efficacy of their action as IC of steel, in comparison with sodium benzoate. Benzoate and phenylacetate buffer solutions of pH 7 are IC of steel and iron anodes in galvanic couples of steel with Al, Cu, Ni, Cr, and Fe-Sn couple. Protective properties of salts of aromatic acids in relation to different brands of steel in water decrease with increasing content of carbon in steel, and also in the presence of chlorides, nitrates and sulfates. Salts of the acids can be used to inhibit corrosion of steel in solutions of NaCl, Na-nitrate, Na-sulfate the concentration of which is less than or equal to 0.001 mole/liter. A study was made of the effect of pH on protective properties of IC and it was found that rate of corrosion of steel decreases with increasing pH of aromatic acid solutions and is fully arrested in phenylacetic bufer of pH 5.5, and in anthranilate and salicylate buffers of pH 6.0. It was ascertained that sodium benzoate, sodium phenylacetate, and sodium anthranilate can prevent corrosion of steel in distilled water at 100°; sodium salicylate -- at a temperature of less than or equal to 60°, and sodium phthalate -- at a temperature of less than or equal to 40°. At 60° the sodium phthalate becomes a promotor of steel corrosion. The study of the effect of forced aeration of the solutions on protective properties of IC

Card 2/3

ACCESSION NR: AR3000206

has revealed that this factor has a dual role. On the one hand, it lowers the minimum inhibitory concentrations of aromatic acid salts, and on the other, it converts the salts of aromatic acids to the type of "harmful IC" which induce at low concentration in water a pit corrosion of steel. It was found that in an oxygen-free medium the salts of aromatic acids do not act as IC of steel. From the authors' summary.

DATE ACQ: 16May63 ENCL: 00 SUB CODE: 00

Card 3/3